

High Sensitivity Semiconductor Sensor Skins for Multi-Axis Surface Pressure Characterization, Phase II

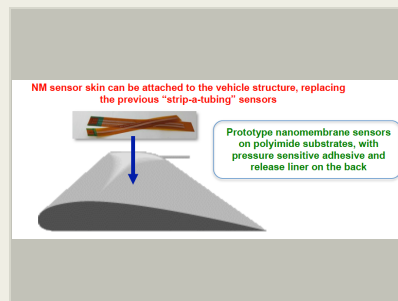
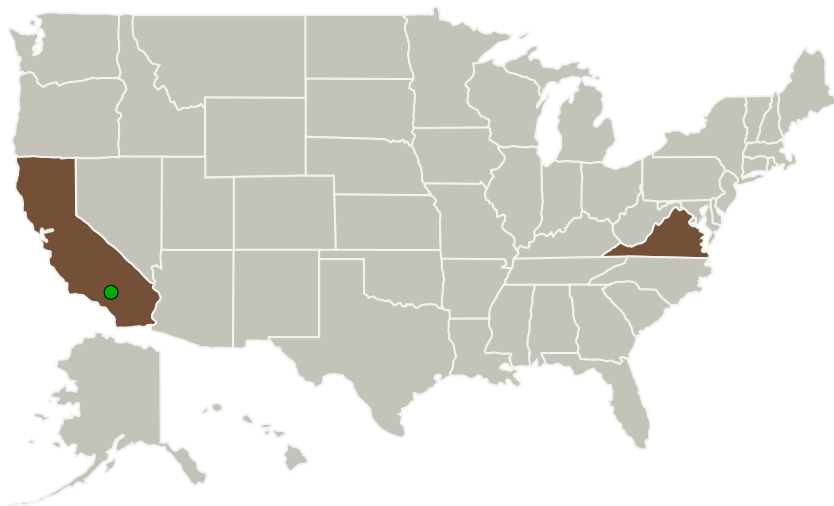
Completed Technology Project (2016 - 2018)



Project Introduction

This NASA Phase II SBIR program would fabricate high sensitivity semiconductor nanomembrane 'sensor skins' capable of multi-axis surface pressure characterization on flight test vehicles, wind tunnel models as well as operational aerospace vehicles, using SOI (Silicon on Insulator) NM techniques in combination with our pioneering HybridSil nanocomposite materials. Such low-modulus, conformal nanomembrane sensor skins with integrated interconnect elements and electronic devices can be applied to new or existing wind tunnel models for multi-axis surface pressure analysis, or to lightweight UAVs as part of active flutter control systems. NanoSonic has demonstrated the feasibility of NM transducer materials in such sensor skins for the measurement of dynamic shear stress and normal pressure. Semiconductor NM sensor skins are thin, mechanically and chemically robust materials that may be patterned in two dimensions to create multi-sensor element arrays that can be embedded into small probe tips or conformally attached onto vehicle and model surfaces. Sensors may be connected to external support instrumentation either through thin film and ribbon cable interconnects, or potentially wirelessly using RF communication directly from electronic networks incorporated into the sensor skin material.

Primary U.S. Work Locations and Key Partners



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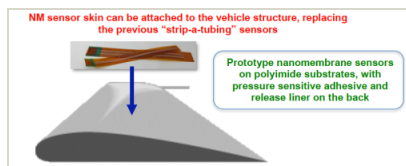


Organizations Performing Work	Role	Type	Location
Nanosonic, Inc.	Lead Organization	Industry	Pembroke, Virginia
● Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations

California	Virginia
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Images



Briefing Chart Image

High Sensitivity Semiconductor Sensor Skins for Multi-Axis Surface Pressure Characterization, Phase II
(<https://techport.nasa.gov/image/134221>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Nanosonic, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Hang Ruan

Co-Investigator:

Hang Ruan

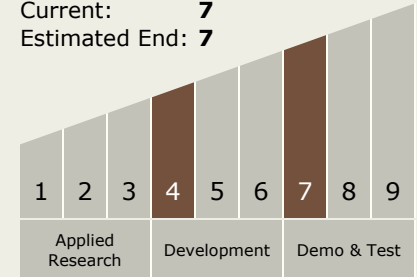
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Technology Maturity (TRL)

Start: **4**
Current: **7**
Estimated End: **7**



Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
 - └ TX11.1 Software Development, Engineering, and Integrity
 - └ TX11.1.1 Tools and Methodologies for Software Design and Development

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System